

TRANSMITTAL LETTER TO THE UNITED STATES  
DESIGNATED/ELECTED OFFICE (DO/EO/US)  
CONCERNING A FILING UNDER 35 U.S.C. 371

CU-2078 RJS

U.S. APPLICATION NO. (If known, see 37 CFR 1.5)

09/446991

INTERNATIONAL APPLICATION NO.  
PCT/DK98/00303INTERNATIONAL FILING DATE  
02 July 1998PRIORITY DATE CLAIMED  
03 July 1997TITLE OF INVENTION METHOD OF OPERATION OF A PRINTING UNIT AND PRINTING UNIT  
OFFSET MACHINEAPPLICANT(S) FOR DO/EO/US  
Henrik LEIMAND et al

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
  - a. ☒ is transmitted herewith (required only if not transmitted by the International Bureau).
  - b. ☐ has been transmitted by the International Bureau.
  - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
  - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
  - b. ☐ have been transmitted by the International Bureau.
  - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
  - d. ☒ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

## Items 11. to 16. below concern document(s) or information included:

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A FIRST preliminary amendment.  
☐ A SECOND or SUBSEQUENT preliminary amendment.
14. ☐ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.
16. ☒ Other items or information:  
\*6 sheets of drawings

Express Mail Label No. EL278279265US

09/446991

17. ☒ The following fees are submitted:**BASIC NATIONAL FEE (37 CFR 1.492(a)(1)-(5)):**

Neither international preliminary examination fee (37 CFR 1.482)  
nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO  
and International Search Report not prepared by the EPO or JPO ..... \$970.00

International preliminary examination fee (37 CFR 1.482) not paid to  
USPTO but International Search Report prepared by the EPO or JPO ..... \$840.00

International preliminary examination fee (37 CFR 1.482) not paid to USPTO but  
international search fee (37 CFR 1.445(a)(2)) paid to USPTO ..... \$760.00

International preliminary examination fee paid to USPTO (37 CFR 1.482)  
but all claims did not satisfy provisions of PCT Article 33(1)-(4) ..... \$670.00

International preliminary examination fee paid to USPTO (37 CFR 1.482)  
and all claims satisfied provisions of PCT Article 33(1)-(4) ..... \$96.00

**ENTER APPROPRIATE BASIC FEE AMOUNT =**

CALCULATIONS PTO USE ONLY

514 Rec'd PCT/PTO 30 DEC 1999

Surcharge of \$130.00 for furnishing the oath or declaration later than ☐ 20 ☐ 30  
months from the earliest claimed priority date (37 CFR 1.492(e)).

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE
Total claims	10 - 20 =	0	X \$18.00
Independent claims	1 - 3 =	0	X \$78.00
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ \$260.00

**TOTAL OF ABOVE CALCULATIONS =**

Reduction of 1/2 for filing by small entity, if applicable. A Small Entity Statement  
must also be filed (Note 37 CFR 1.9, 1.27, 1.28).

**SUBTOTAL =**

Processing fee of \$130.00 for furnishing the English translation later than ☐ 20 ☐ 30  
months from the earliest claimed priority date (37 CFR 1.492(f)).

**TOTAL NATIONAL FEE =**

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be  
accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +

**TOTAL FEES ENCLOSED =**

Amount to be:	\$
refunded	
charged	\$

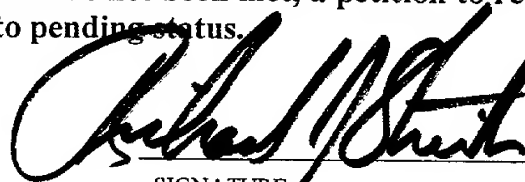
- a. ☒ A check in the amount of \$ 970.00 to cover the above fees is enclosed.
- b. ☐ Please charge my Deposit Account No. \_\_\_\_\_ in the amount of \$ \_\_\_\_\_ to cover the above fees.  
A duplicate copy of this sheet is enclosed.
- c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any  
overpayment to Deposit Account No. 12-0400. A duplicate copy of this sheet is enclosed.

**NOTE:** Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

Ladas & Parry  
224 South Michigan Avenue  
Chicago, Illinois 60604  
(312) 427-1300

December 30, 1999



SIGNATURE:

Richard J. Streit

NAME

25765

REGISTRATION NUMBER

**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

☒ In re application of\*: Henrik Leimand  
 Serial No.: \_\_\_\_\_ Group No.: \_\_\_\_\_  
 Filed: \_\_\_\_\_ Examiner: \_\_\_\_\_  
 For\*: Method of operation of a Printing Unit and Printing  
 Unit for Offset-machine  
☐ Patent No.: \_\_\_\_\_ Issued: \_\_\_\_\_

\*NOTE: Insert name(s) of inventor(s) and title also for patent. Where statement is with respect to a maintenance fee payment also insert application serial number and filing date and add Box M. Fee to address.

**VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY  
 STATUS (37 CFR 1.9(c-f) and 1.27(b-d))**

With respect to the invention described in

- ☒ the specification filed herewith as a completion of PCT/DK98/00303 filed  
☐ application serial no. \_\_\_\_\_, filed July 3, 1998  
☐ patent no. \_\_\_\_\_, issued \_\_\_\_\_

**I. IDENTIFICATION OF DECLARANT AND RIGHTS AS A SMALL ENTITY**

I hereby declare that I am

(complete either (a), (b), (c) or (d) below):

**(a) Independent Inventor**

- ☐ a below named independent inventor and that I qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees under Section 41(a) and (b) of Title 35, United States Code to the Patent and Trademark Office.

**(b) Non-inventor Supporting a Claim By Another**

- ☐ making this verified statement to support a claim by \_\_\_\_\_

for a small entity status for purposes of paying reduced fees under Section 41(a) and (b) of Title 35, United States Code and I hereby declare that I would qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees under 41(a) and (b) of Title 35, United States Code, if I had made the above identified invention.

**(c) Small Business Concern**

- ☒ the owner of the small business concern identified below:  
☐ an official of the small business concern empowered to act on behalf of the concern identified below:

NAME OF CONCERN Tresu A/S  
 ADDRESS OF CONCERN Eegsvej 14-16, DK-6091 Bjert, Denmark

\_\_\_\_\_ and  
 that the above identified small business concern qualifies as a small business concern as defined in 13 CFR 121.3-18, and reproduced in 37 CFR 1.9(d), for purposes of paying reduced fees under Section 41(a) and (b) of the Title 35, United States Code, in that the number of employees of the concern, including those of its affiliates, does not exceed 500

persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.

**(d) Non-Profit Organization**

- ☐ an official empowered to act on behalf of the nonprofit organization identified below:

NAME OF ORGANIZATION \_\_\_\_\_

ADDRESS OF ORGANIZATION \_\_\_\_\_

**TYPE OR ORGANIZATION**

- ☐ UNIVERSITY OR OTHER INSTITUTION OF HIGHER EDUCATION
- ☐ TAX EXEMPT UNDER INTERNAL REVENUE SERVICE CODE (26 USC 501(a) and 501(c) (3))
- ☐ NONPROFIT SCIENTIFIC OR EDUCATIONAL UNDER STATUTE OF STATE OF THE UNITED STATES OF AMERICA  
(NAME OF STATE \_\_\_\_\_)  
(CITATION OF STATUTE \_\_\_\_\_)
- ☐ WOULD QUALIFY AS TAX EXEMPT UNDER INTERNAL REVENUE SERVICE CODE (26 USC 501(a) and 501(c) (3)) IF LOCATED IN THE UNITED STATES OF AMERICA
- ☐ WOULD QUALIFY AS NONPROFIT SCIENTIFIC OR EDUCATIONAL UNDER STATUTE OF STATE OF THE UNITED STATES OF AMERICA IF LOCATED IN THE UNITED STATES OF AMERICA  
(NAME OF STATE \_\_\_\_\_)  
(CITATION OF STATUTE \_\_\_\_\_)

and that the nonprofit organization identified above qualifies as a nonprofit organization as defined in 37 CFR 1.9(e) for purposes of paying reduced fees under Section 41(a) and (b) of Title 35, United States Code.

**II. OWNERSHIP OF INVENTION BY DECLARANT**

I hereby declare that rights under contract or law remain with and/or have been conveyed to the above identified

- ☐ person (item (a) or (b) above)      ☒ concern (item (c) above)      ☐ organization (item (d) above)

EXCEPT, that if the rights held are not exclusive, each individual, concern or organization having rights to the invention is listed below\* and no rights to the invention are held (1) by any person who could not be classified as an independent inventor under 37 CFR 1.9(c) if that person had made the invention, (2) any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or (3) a non-profit organization under 37 CFR 1.9(e).

- ☒ no such person, concern, or organization
- ☐ person, concerns or organizations listed below\*

\*NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27).

FULL NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

☐ INDIVIDUAL

☐ SMALL BUSINESS CONCERN

☐ NONPROFIT ORGANIZATION

FULL NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

☐ INDIVIDUAL

☐ SMALL BUSINESS CONCERN

☐ NONPROFIT ORGANIZATION

### III. ACKNOWLEDGEMENT OF DUTY TO NOTIFY PTO OF STATUS CHANGE

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

### IV. DECLARATION

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

### V. SIGNATURES

*(complete only (e) or (f) below)*

(e)

*NOTE: All inventors must sign the verified statement*

\_\_\_\_\_  
Name of Inventor

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature of Inventor

\_\_\_\_\_  
Name of Inventor

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature of Inventor

\_\_\_\_\_  
Name of Inventor

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature of Inventor

*add lines for any additional inventors who must sign*

OR

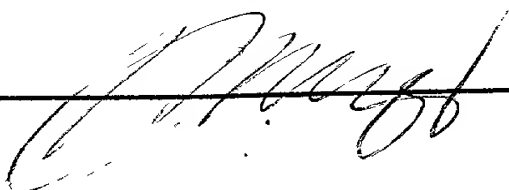
(f)

NOTE: The title of the person signing on behalf of a concern or non-profit organization should be specified.

NAME OF PERSON SIGNING Johannes Berger  
TITLE OF PERSON Managing Director

(If signing on behalf of a concern or non-profit organization)

ADDRESS OF PERSON SIGNING Fjordvej 26  
DK-6000 Kolding, Denmark

SIGNATURE  DATE 13/12-1999

DOCKET: CU-2078

**IN THE UNITED STATES PATENT & TRADEMARK OFFICE**

APPLICANT: Henrik LEIMAND et al )  
 )  
TITLE: METHOD OF OPERATION OF A PRINTING )  
UNIT AND PRINTING UNIT OFFSET MACHINE )  
 )  
COMPLETION OF PCT/DK98/00303 filed 02 July 1998 )

The Assistant Commissioner for Patents (DO/EO/US)  
Box PCT  
Washington, D.C. 20231

**PRELIMINARY AMENDMENT**

Dear Sir:

Please amend the application being filed herewith under 35 USC 371.

**IN THE CLAIMS:**

Please cancel claims 1-10 as filed and substitute new claims 11-20 as follows:

11. A method of operation of a printing unit in an offset machine wherein the printing unit comprising a doctor blade chamber device is used for lacquer application and as dampening unit for water application.

12. A printing unit for use by a method according to claim 11 in an offset machine comprising means for lacquer application and means for water application, the lacquer application means and the water application means are comprised of a unit comprising a doctor blade chamber device and at least a roller for transferring lacquer or water from the doctor blade chamber device to the plate cylinder of the printing unit.

13. A printing unit according to claim 12, wherein the lacquer and water application means are based on the use of one and the same doctor blade chamber device.

14. A printing unit according to claim 13, wherein the lacquer application means comprises only one transfer roller in the form of a screen roller transferring lacquer directly from the doctor blade chamber device to the plate cylinder.

15. A printing unit according to claim 13, wherein the water application means comprises transfer rollers in the form of a screen roller and a rubber roller for transferring water from the doctor blade chamber device to the plate cylinder.

16. A printing unit according to claim 12, wherein the doctor blade chamber device/transfer roller unit is displaceably mounted relative to the plate cylinder between an engagement position and in idling position.

17. A printing unit according to claim 12, wherein the unit is provided with coupling means adapted to be releasably connected to coupling means in the offset machine, preferably coupling means for a cleaning unit known per se for the plate cylinder.

18. A printing unit according to claim 12, wherein the transfer roller is driven by its own motor, preferably via a motor controlled by tacho signal from the main machine.

19. A printing unit according to claim 12, wherein the unit comprising the doctor blade chamber device and at least one roller is replaceably mounted in the offset machine with the existing dampening unit of the offset machine.

20. A printing unit according to claim 12, wherein the transfer roller which is in contact with the plate cylinder of the printing unit is mounted in the bearing of the offset machine for a conventional transfer cylinder in a dampening unit, and wherein the plate cylinder simultaneously is in contact with two units comprising a doctor blade chamber device and transfer rollers for application of lacquer and water, respectively, to the plate cylinder.

**REMARKS**

The aforesaid claims are based on the claims as filed in the PCT international



application, with amendments to place the same in better condition for examination under U.S. rules of practice.

Respectfully submitted,

12/30/99  
Date

Richard J. Streit  
Attorney for Applicant

Richard J. Streit, Reg. 25765  
c/o Ladas & Parry  
224 South Michigan Avenue  
Chicago, Illinois 60604  
(312) 427-1300

0044020 76694460

METHOD OF OPERATION OF A PRINTING UNIT AND PRINTING UNIT FOR  
OFFSET MACHINE

5 The present invention relates to a method of operation of a printing unit and a printing unit for use in an offset machine comprising lacquer application means and water application means.

10 Offset machines are known in the art and therefore will only be briefly explained. A web or a sheet to be printed is passed between printing rollers or transfer rollers. The web or the sheets are made to abut on a blanket cylinder for application of the print to be applied in the individual printing unit in the offset machine. The blanket cylinder is in contact with a plate cylinder which transfers the colour print which is to be placed on the web. The plate cylinder is in contact with dampening unit and an inking unit applying damp and ink, respectively. Thus, an offset plate on the plate cylinder will be  
15 rotated whereby water receptive parts are dampened by the rollers of the dampening unit. Then the ink receptive parts of the offset plate are provided with ink from the inking rollers in the inking unit. The formed image is then applied to the blanket cylinder which in turn applies the ink onto the web or the sheet. Preferably a paper web is used, but other materials may also be used for printing.

20 A printing unit according to the present invention may be used in a traditional offset machine, for example of the type disclosed in EP 767.058. The contents of this patent application is hereby incorporated by reference, as the printing unit may form a part of an offset machine constructed according to the same principle and with the same sheet  
25 feeder and sheet delivery means at the beginning and the end of the printing unit, just like there may be used similar means for transferring paper web or sheets between different, consecutive printing units to apply the finished image to the web. Likewise, the same type of printing ink may be employed. Offset machines may be equipped with a lacquering unit. The lacquering unit will typically be constructed with a plate  
30 cylinder onto which the lacquer is applied from a roller arrangement which is supplied from a pan with clear lacquer.

It is the object of the present invention to provide a method of operation of a printing unit and a printing unit for an offset machine allowing a broader use and a more effective operation of printing units in existing offset machines. Furthermore, it is an object to provide a printing unit which simultaneously may be used for application of lacquer and ink in the same printing unit.

According to the present invention this is achieved with a method characterised in that the printing unit comprising a doctor blade chamber device is used for lacquer application and as a dampening unit for water application.

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The printing unit for use by the method is characterised in that the lacquer application means and the water application means are comprised of a unit comprising a doctor blade chamber device and at least a roller for transferring lacquer or water from the doctor blade chamber device to the plate cylinder of the printing unit.

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By using such a method and such a unit, it becomes possible to modify existing offset machines such that they find a broader use and simultaneously the process may run faster. The amount of ink or damp located in the holes on the transfer roller will be transferred to the plate cylinder either directly or via a rubber roller.

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It will be possible to use separate doctor blade chamber devices for lacquer application or water application. However, it will also be possible to use one and the same doctor blade chamber device for lacquer or water application.

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In a lacquering unit, which typically will be the last printing unit in an offset machine, it is advantageous that the lacquer application means comprises only one screen roller in the form of an anilox roller for transferring the lacquer applied directly from the doctor blade chamber device to the plate cylinder. This construction may be further developed. According to a special embodiment, most printing units will be provided with a support for supporting a cleaning system comprised of a liquid spraying nozzle and wiping paper. This system may be detachably mounted on the support. According to an advantageous embodiment, this support may also be used for supporting the lac-

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quer application means in the form of the doctor blade chamber device and the screen roller. In such a situation, the screen roller will preferably be driven by its own motor, preferably a tacho motor. Thus, the coupling means located in the frame of the offset machine can be reused as coupling means for the unit according to the invention.

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The motor which is being used to drive the screen roller is an independent motor in order to be able to adjust the number of revolutions for different offset machines. Thus, the unit does not require a special adjustment of the drive of the screen rollers for different offset machines. In the machine, all that is required is a suspension which in its most simple form comprises four pins or screws on a support.

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By use of a unit according to the invention based on a doctor blade chamber device, it will be possible to apply strongly pigmented inks, as for example metal lacquer. This will not be possible with conventional printing units, as pigments/inks will clot and make quality printing impossible.

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The unit according to the invention may also be used as a dampening unit. In the known dampening units an environmental problem arises. To transfer the dampening water with the present roller arrangement, it is necessary to add solvents. At present, this has been prohibited in several places.

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Alternatively, attempts have been made to solve the problem by using Teflon coating to form a sort of mask so as to avoid ink setoff in certain areas. This is known as dry offset and, in principle, is a different process. Thus, Teflon may be used to replace water application from the dampening rollers. This system has an advantage as the paper is not dampened and so there is no risk of poor attachment of lacquer.

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Instead of using the traditional dampening units, according to the present invention a system comprising a doctor blade chamber device and a transfer roller may be used. According to a preferred embodiment, a screen roller and a rubber roller are used between the doctor blade chamber device and a plate cylinder. This is advantageous as it allows a faster printing than previously. The amount of water or the water bead which

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is being formed in a wedge-shaped space between the rubber roller and the plate cylinder can be varied by operating at varying speeds between the rubber roller and the plate cylinder. By operating the rubber roller at a greater speed, it is thus possible to provide a greater amount of water in the wedge. The amount of water can also be adjusted by varying the clearance of the rubber roller and the plate cylinder. The printing unit according to the invention is thus advantageous in that the amount of water located in the clearance may be varied according to need.

As a printing unit is intended either for lacquer or as dampening unit, it will be possible to use same unit comprising a doctor blade chamber device and transfer roller for both water and for lacquer.

If the plate cylinder is provided with rubber blanket, it will be possible to place cardboard under the blanket wherein a so-called window is made, i.e. an area which is cut out. Hereby, no print is made in this area. This provides the possibility of the finished image being provided with a blank space in this area, for example for a bar code or for adhesive.

By use of a conventional dampening unit, it will not be possible to apply lacquer. Because of the surface rates, there will be a substantial and unacceptable pollution of the surroundings as lacquer will splash from the periphery of the roller and from the ends of the rollers. By using the unit according to the invention as dampening unit, it will be possible to avoid pollution.

It will also be possible that two units according to the invention are provided together with the plate cylinder, of which the one unit is used for lacquer application and the other for water application. Hereby it will be possible to provide lacquer stripes and ink stripes side by side on the plate cylinder. This is made possible as doctor blade chamber devices can be divided to supply liquid/ink over a part of their length. Thus, hereby is achieved the possibility of making prints with entirely new effects.

In traditional offset machines more printing units will usually be provided. There have been a growing need and a desire to be able to employ lacquer application on the formed colour prints. Lacquer application is used as a final layer providing a lacquer layer atop the formed colour print. This lacquer application yields a better quality and a greater depth in the formed print. If it is desired to be able to apply lacquer, it has been necessary to supplement the traditional offset machines with an extra lacquering unit. The lacquering unit normally has a structure which is comparable to that of a dampening unit. This means that the lacquering unit transfers lacquer from a lacquer reservoir via a roller arrangement and a contact roller which abuts on the plate cylinder.

With the present invention it is possible to modify one or all of the desired printing units. The one or all the printing units which are not rebuilt are used for offset-printing. It is, for example, possible to modify an existing offset machine with four printing units. This may take place by modifying the last printing unit in the operating direction of the machine. The three preceding printing units then use the primary colours to make of the desired colour print. In the one or all of the modified printing units, the offset inking unit is detached from the plate cylinder. Then the dampening unit is replaced by a unit comprising a doctor blade chamber device and a screen roller which is moved into engagement with the plate cylinder. In this system, the plate cylinder will be provided with a rubber blanket which is in contact with the hard screen roller. If, at a later time, it is desired not to use lacquer application, it will be possible to demount the unit comprising the screen roller and the doctor blade chamber device and re-mount the rollers of the dampening unit.

If frequent changes are required, it will be possible to place the dampening unit and a unit comprising the screen roller/doctor blade chamber device on a slide system such that these two systems optionally may be moved into and out of engagement with the plate cylinder. By the conversion from lacquer operation to conventional inking operation and vice versa in such a printing unit, it will thus be necessary to exchange the plate on the plate cylinder as a rubber blanket is used when the lacquering unit is in

engagement, whereas conventionally a metal plate is used when the dampening unit and the inking unit are in engagement with the plate cylinder.

5 The invention will now be described in detail with reference to the accompanying schematic drawing, in which

Fig. 1 shows a side view of a typical offset machine comprising four printing units,

Fig. 2 shows a partial view illustrating a known printing unit comprising a dampening unit and an inking unit,

10 Fig. 3 shows a view corresponding to Fig. 2 illustrating a first embodiment of a printing unit according to the invention,

Fig. 4 shows a view corresponding to Fig. 2 illustrating a second embodiment of a printing unit according to the invention,

Fig. 5 shows an example of a known arrangement in a printing unit,

15 Fig. 6 shows a view corresponding to Fig. 5 illustrating a further embodiment of a printing unit according to the invention, and

Fig. 7 shows a view illustrating a further embodiment of a printing unit according to the invention.

20 Fig. 1 shows a traditional offset printing machine 1 comprising four printing units 2. The machine has a transport direction 3 for sheets being printed. The sheets come from a feeder station 4 and is transferred to a delivery station 5 by means of a feeder arrangement 6 comprising a conveyor belt 7. The conveyor belt 7 extends around two rollers 8,9. The individual sheets are transferred from the unit 4 via a track 10 around  
25 an impression cylinder 12. The individual sheets are placed at a position indicated by 13. Thus, the sheets are placed in an area between a blanket cylinder 14 and an impression cylinder 12. The blanket cylinder 14 is in contact with a plate cylinder 15. Apart from the impression cylinders 12, the offset machine also comprises transfer cylinders 16 for the sheets.

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Furthermore, the offset machine comprises gripper means for holding the sheets and a plurality of rollers for dampening units and inking units which are connected to the

plate cylinder. As these are well known, they are not shown in Fig. 1 which serves to illustrate the construction of the offset unit. However, these rollers are shown in Fig. 2.

Fig. 2 shows a printing unit 1 comprising an impression cylinder 12, a blanket cylinder 14 and a plate cylinder 15. These cylinders rotate according to the arrows 17,18,19. A dampening unit comprises a container 21 for water. From the water container 21 the water is led via a system of rollers 22 to the last contact roller 23 abutting on the plate cylinder 15. Furthermore, the printing unit 1 comprises an inking unit 24 comprising a number of rollers 25 which transfer ink from an ink fountain 26 to contact rollers 27 applying the ink to a plate (not shown) located on the plate cylinder 15. Thus, the plate which is located on the plate cylinder will be supplied with ink in the areas to which no water has been applied from the dampening unit 20. The plate will usually be an etched metal plate.

As an inking unit, in principle, is constructed like the dampening unit 20, Fig. 2 can also be said to illustrate an inking unit. Thus, the ink will be fed from the container 22 containing lacquer and be transferred via rollers 22 to the last contact roller 23 also called the forme inking roller.

The shown embodiment possesses certain environmental and technical disadvantages. Instead of using the existing dampening unit, the printing unit shown in Fig. 2 can be modified as illustrated in Fig. 3.

In Fig. 3 the contact roller 23 is replaced by a unit 28 comprising a screen roller 29, preferably an anilox roller, of the kind used in flexographic printing. The screen roller 29 may be mounted directly in the existing suspension. On the screen roller 29, a doctor blade chamber device 30 is mounted. Even at large peripheral rates, the unit 28 can ensure a constant and uniform amount of water and/or lacquer being transferred to the plate cylinder 15. If it is desired to use the unit 28 for lacquer application, the rollers 27 of the inking unit are moved out of engagement with the plate cylinder 15. If the unit 28 is used for water application, the inking unit 24 is maintained in engagement with the plate cylinder 15.



In the shown embodiment, the use of the hard screen roller 29 will necessitate the use of a rubber blanket on the plate cylinder 15.

5 The shown printing unit will be very simple and easy to maintain. Simultaneously, the system will be easy to convert depending on whether it is desired to use the printing unit for one purpose or the other. Thus, according to ones wishes, it will be possible to use the existing dampening unit concurrently with the unit 28 according to the invention.

10 When the unit 28 is used for water application, it will be easy to adjust the amount of water in a simple manner. Such an adjustment of the amount of water is difficult in traditional dampening units where the rollers run synchronously with the plate cylinder 15. The screen roller 29 may be provided with its own motor driven independently of the plate cylinder. This provides the possibility of a differentiated peripheral rate and thereby the possibility of damming up larger or smaller amounts of water in the wedge-shaped space 31 formed between the screen roller 29 and the plate cylinder 15.

15 In Fig. 4, there is shown a further embodiment of a printing unit 1 according to the invention. Fig. 4 differs from the printing unit shown in Fig. 3 in that between the unit 28 there is placed a further roller, viz. a rubber roller 32. By using a dampening unit constructed according to this principle, the dampening water will be transferred to the plate cylinder 15 from the doctor blade chamber device 30 via the screen roller 29 to the rubber roller 32 which will apply the dampening medium/water onto the plate cylinder 15. This arrangement is particularly advantageous with the opportunity for speed variation. Thus, the peripheral rate in this embodiment may easily be varied relative to the peripheral rate on the plate cylinder with regard to varying the damp supply according to wish. In the embodiment shown in Fig. 4, the plate cylinder 15 can be used with a traditional metal plate whereto the ink is applied in the inking unit 24.

30

In Fig. 5 there is shown a known cleaning arrangement 33 to be used for a plate cylinder 15. The cleaning arrangement 33 comprises a liquid nozzle 34 which sprays a liq-

uid onto the plate cylinder and onto a wiping belt 35 extending around the roller 35'. The rollers 35' and the nozzle 34 are mounted on a support 36. The support 36 is mounted on pins 37 fastened to the frame 38 of the offset machine.

5 The arrangement 33 may be secured to the pins 37 by bolts or in another way. However, the arrangement is detachable from these pins. Thus, it will be possible to replace the shown arrangement by a unit illustrated in Fig. 6 and comprising a doctor blade chamber device 30 and a screen roller 29. The unit 28 is mounted on a supporting frame 39. The supporting frame 39 is mounted on the frame 38 of the machine via  
10 the pins 37. Thus, it is easy to substitute the unit 28 for the device 33.

The roller 29 is driven by its own motor 40 by means of a belt connection or another suitable transmission connection. The motor 40 is preferably a tacho motor, such that  
15 the rotational speed can be set according to wish and adjusted to the rotational speed of the plate roller 15. The unit 28 is pivotally mounted about a bearing 41, such that it may be pivoted out of and into engagement with the roller 15. The doctor blade chamber device 30 is mounted on an arm 42 via a pivotal bearing 43 such that it can be adjusted to the screen roller 29. The mutual swinging of the system may be established  
20 by means of a cylinder 44.

Fig. 7 shows a further embodiment of a printing unit according to the invention. In this printing unit, there is a simultaneous use of two units 28. In this embodiment, there is not shown an inking unit 24 corresponding to the inking unit 24 in Figs. 2,3 and 4. However, such an inking unit will also form part of this embodiment. The unit 28 il-  
25 lustrated to the right in the Figure, is used for the application of damp. The unit 28 illustrated to the left is used for the application of lacquer. As it is possible to divide the doctor blade chamber device across its length, it will be possible to apply lacquer in stripes where the dampening unit does not apply damp. Such an effect will not be possible in traditional printing units. The inking unit and the dampening unit illus-  
30 trated in Fig. 7 will work according to the same principle as explained above with reference to the preceding Figures.

## CLAIMS

1. A method of operation of a printing unit in an offset machine characterised in that the printing unit comprising a doctor blade chamber device is used for lacquer application and as dampening unit for water application.
2. A printing unit for use by a method according to claim 1 in an offset machine comprising means for lacquer application and means for water application, characterised in that the lacquer application means and the water application means are comprised of a unit comprising a doctor blade chamber device and at least a roller for transferring lacquer or water from the doctor blade chamber device to the plate cylinder of the printing unit.
3. A printing unit according to claim 2, characterised in that the lacquer and water application means are based on the use of one and the same doctor blade chamber device.
4. A printing unit according to claim 3, characterised in that the lacquer application means comprises only one transfer roller in the form of a screen roller transferring lacquer directly from the doctor blade chamber device to the plate cylinder.
5. A printing unit according to claim 3, characterised in that the water application means comprises transfer rollers in the form of a screen roller and a rubber roller for transferring water from the doctor blade chamber device to the plate cylinder.
6. A printing unit according to any one of the claims 2-5, characterised in that the doctor blade chamber device/transfer roller unit is displaceably mounted relative to the plate cylinder between an engagement position and an idling position.
7. A printing unit according to any one of the claims 2-6, characterised in that the unit is provided with coupling means adapted to be releaseably connected to cou-

pling means in the offset machine, preferably coupling means for a cleaning unit known per se for the plate cylinder.

5 8. A printing unit according to any one of the claims 2-7, characterised in that the transfer roller is driven by its own motor, preferably via a motor controlled by tacho signal from the main machine.

10 9. A printing unit according to any one of the claims 2-8, characterised in that the unit comprising the doctor blade chamber device and at least one roller is replaceably mounted in the offset machine with the existing dampening unit of the offset machine.

15 10. A printing unit according to any one of the claims 2-9, characterised in that the transfer roller which is in contact with the plate cylinder of the printing unit is mounted in the bearing of the offset machine for a conventional transfer cylinder in a dampening unit, and that the plate cylinder simultaneously is in contact with two units comprising a doctor blade chamber device and transfer rollers for application of lacquer and water, respectively, to the plate cylinder.



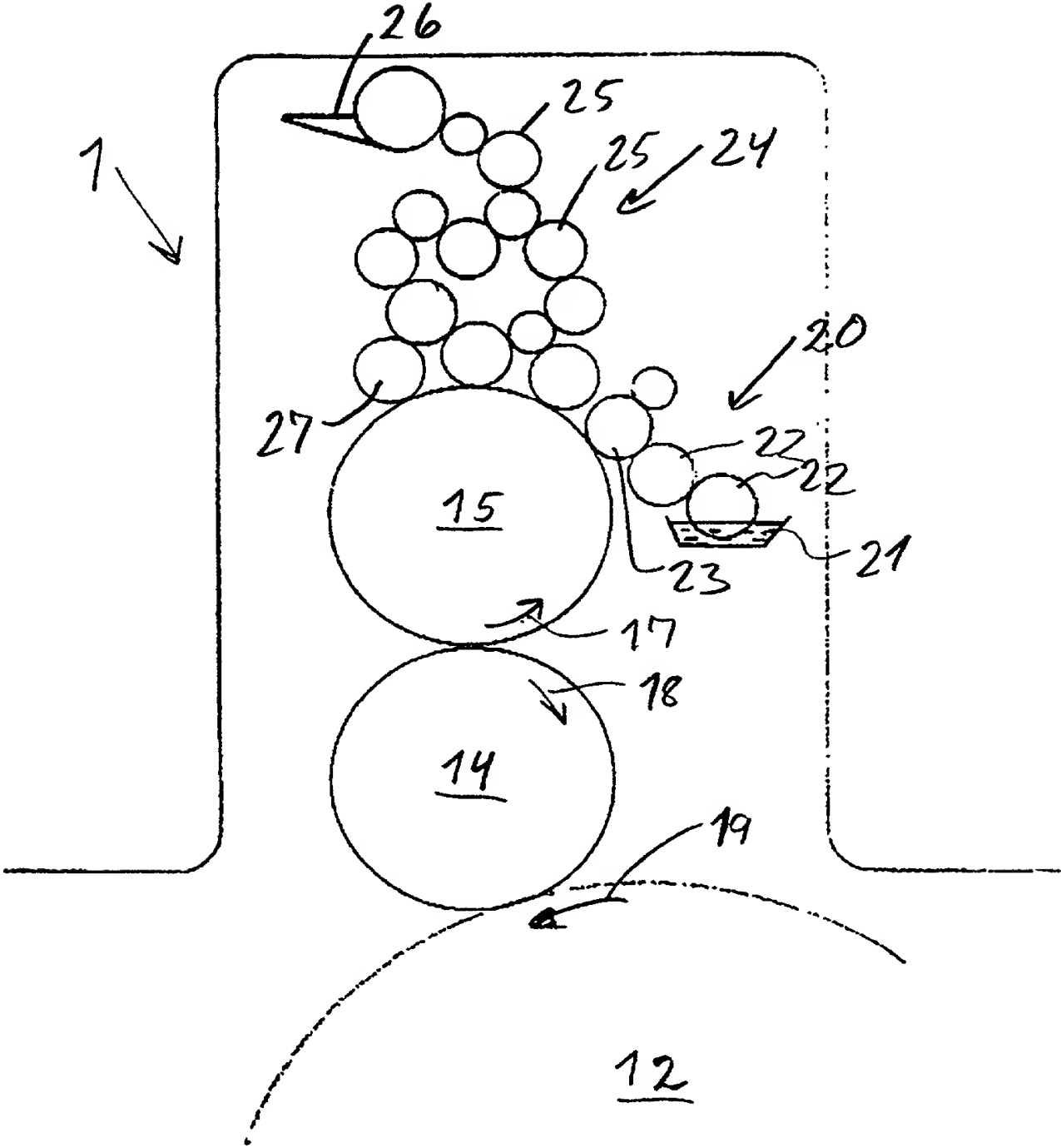


FIG.2

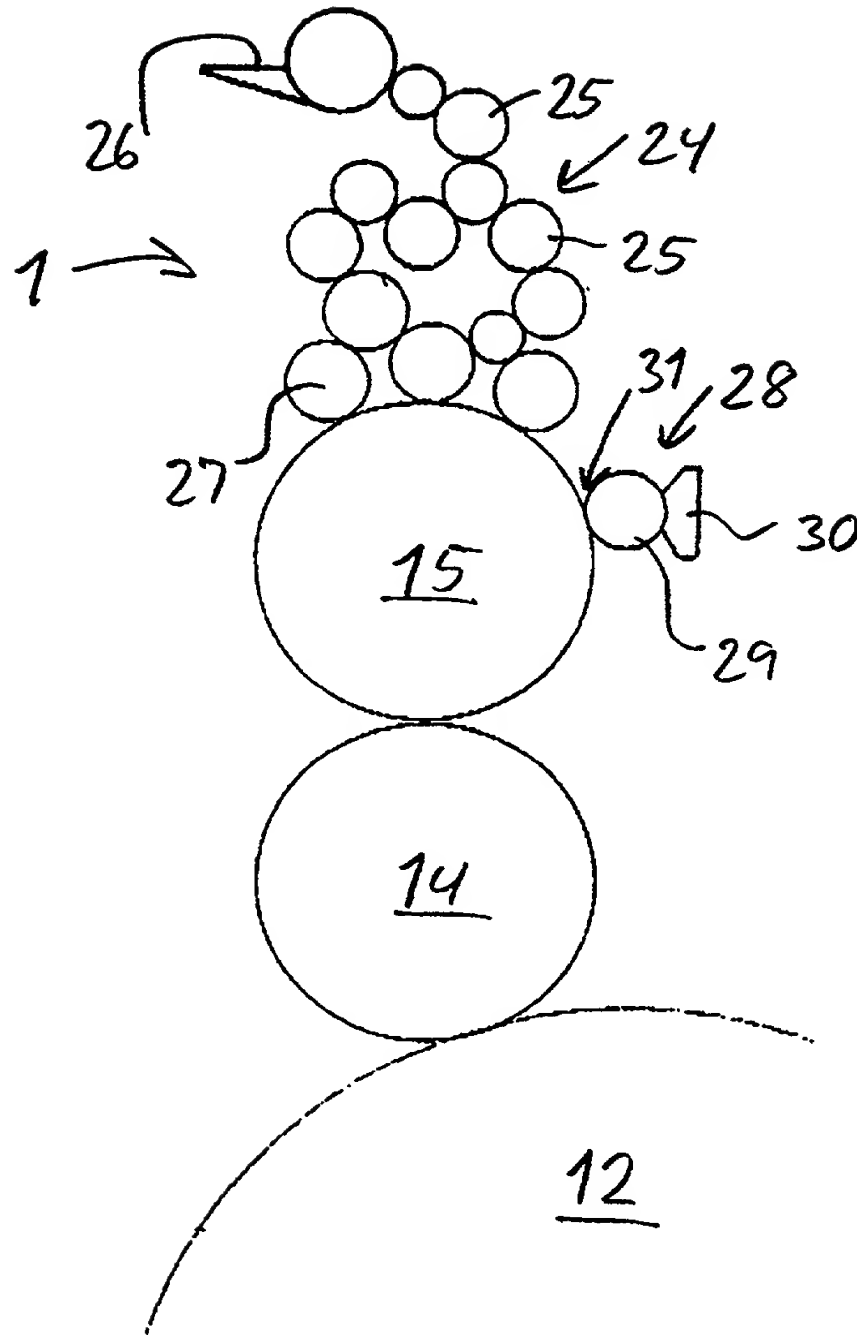


FIG. 3

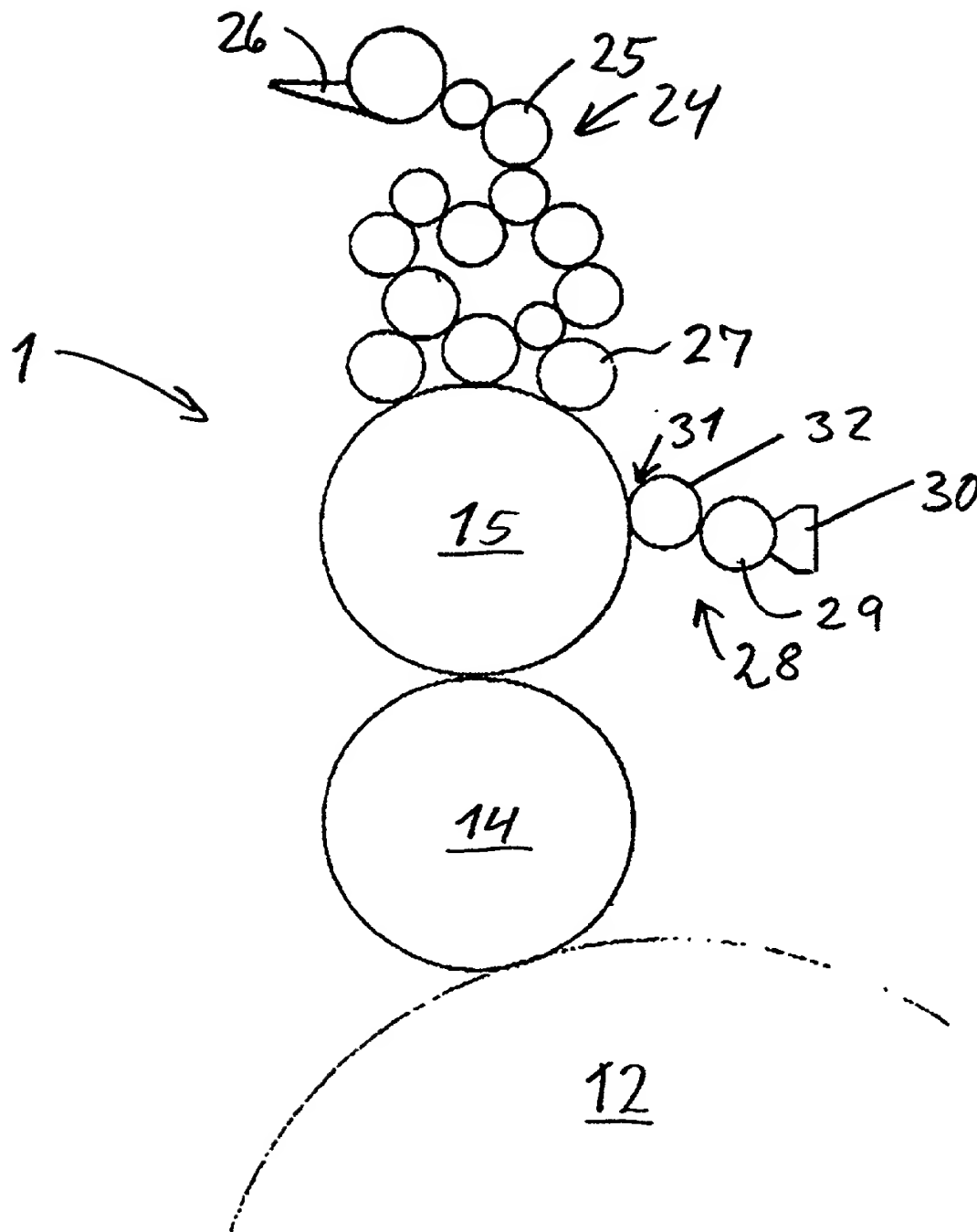
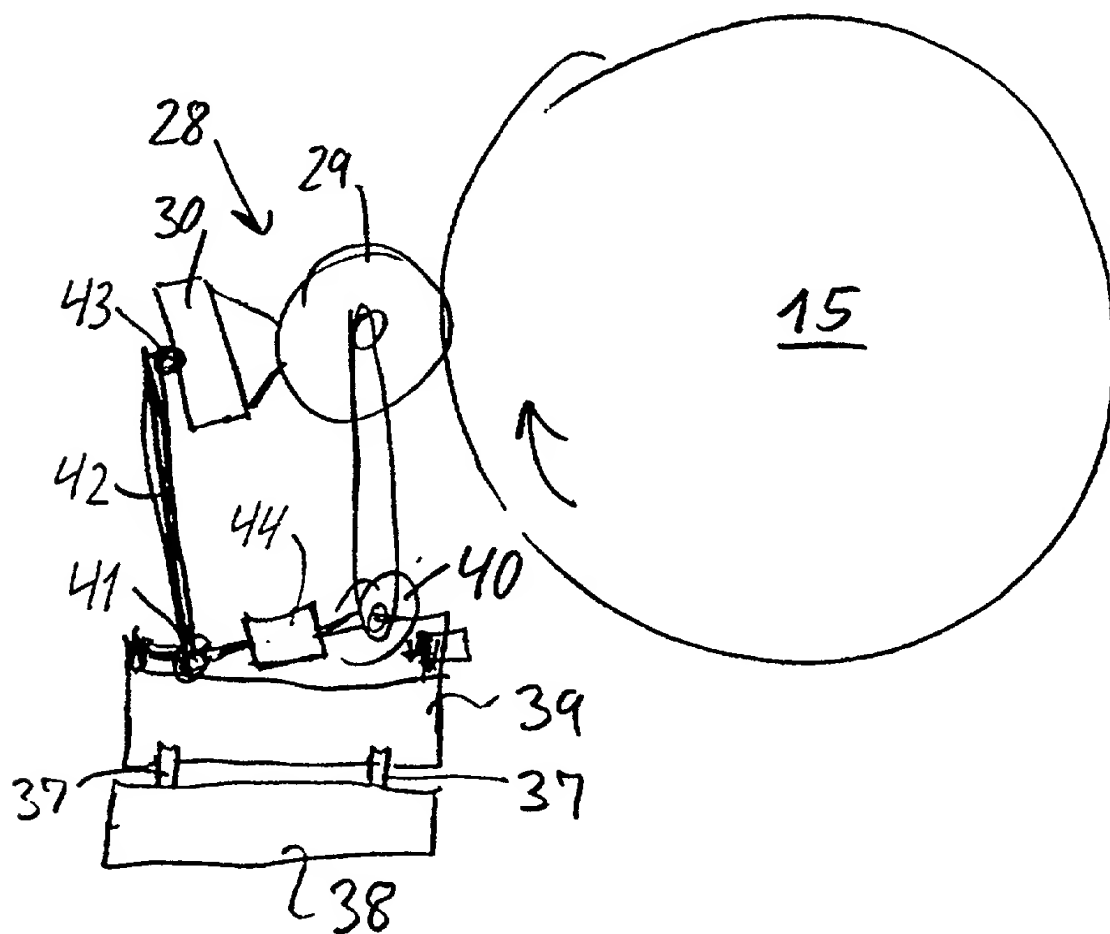
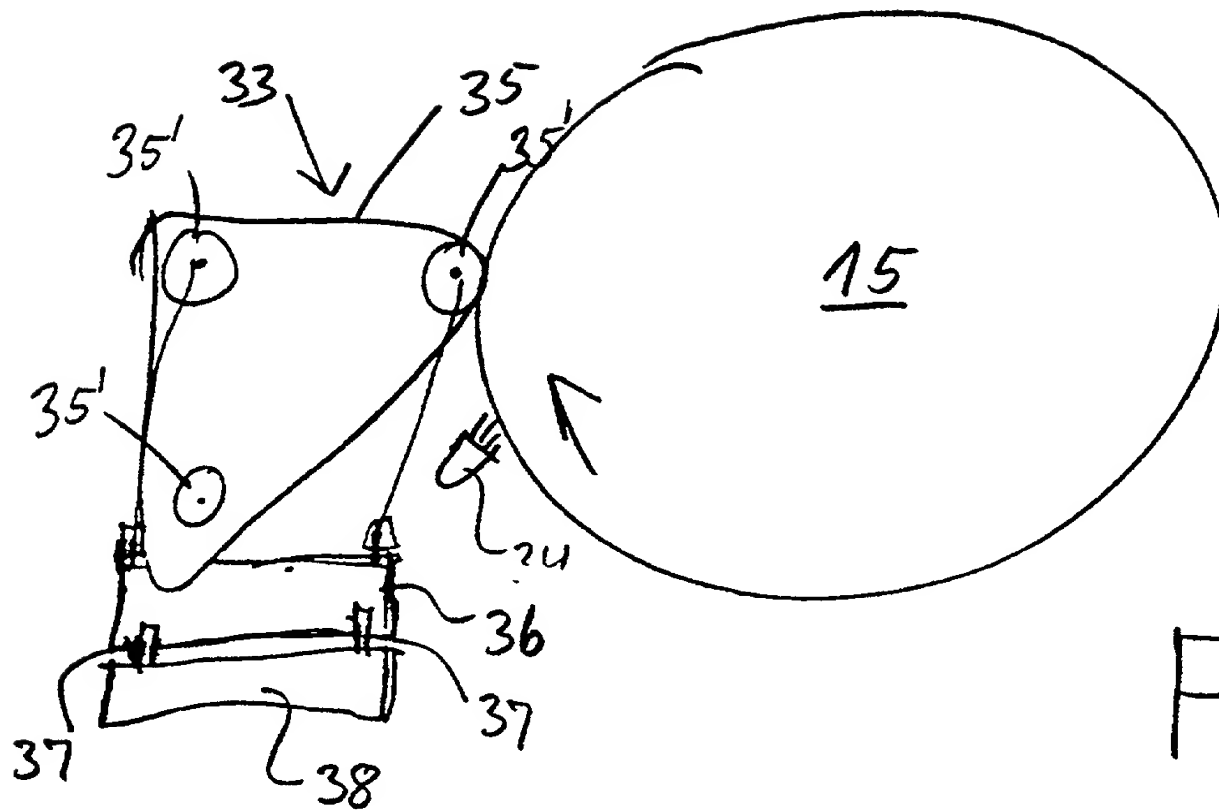


FIG. 4

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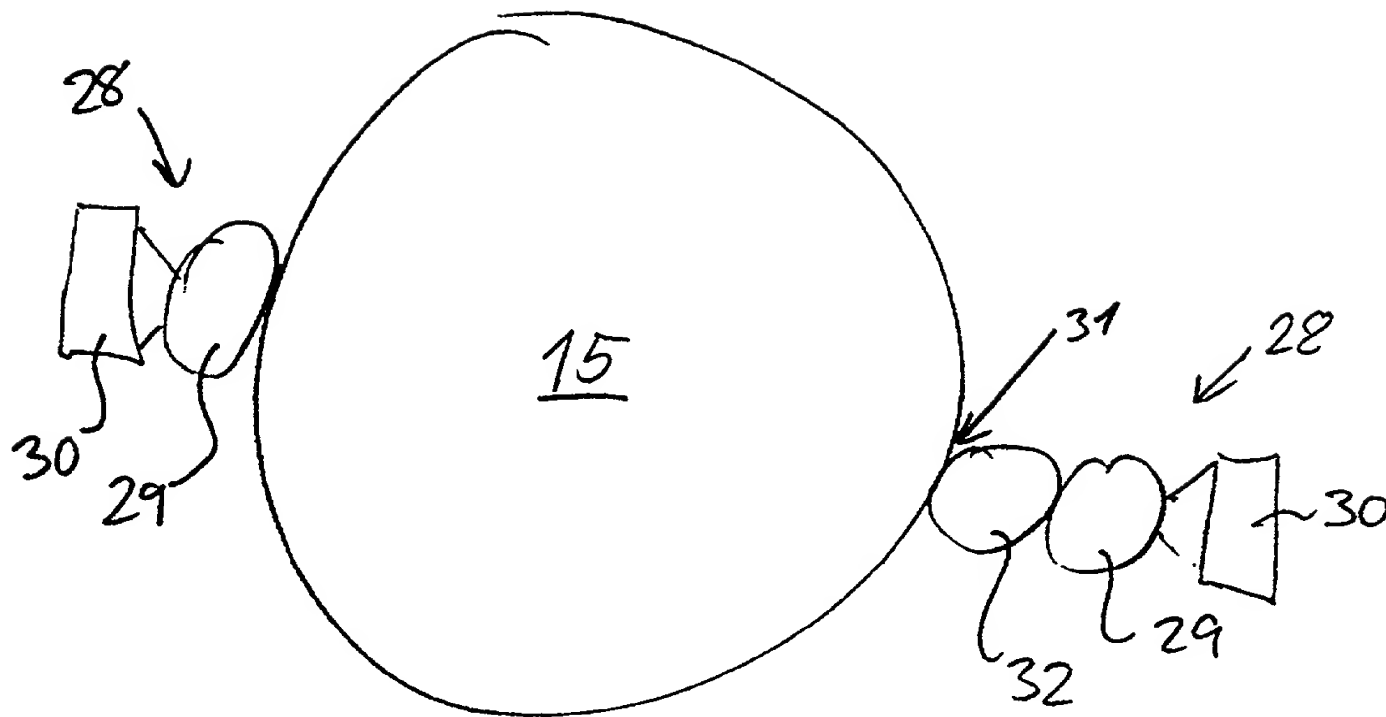


FIG. 7

Docket:

## COMBINED DECLARATION AND POWER OF ATTORNEY

(ORIGINAL, DESIGN, NATIONAL STAGE OF PCT, SUPPLEMENTAL, DIVISIONAL,  
CONTINUATION OR CIP)

As a below named inventor, I hereby declare that:

### TYPE OF DECLARATION

This declaration is of the following type: (check one applicable item below)

- ☐ original
- ☐ design
- ☐ supplemental

Note: If the Declaration is for an International Application being filed as a divisional, continuation or continuation-in-part application, do not check next item; check appropriate one of last three items.

☒ national stage of PCT

Note: If one of the following 3 items apply, then complete and also attach ADDED PAGES FOR DIVISIONAL, CONTINUATION OR CIP.

- ☐ divisional
- ☐ continuation
- ☐ continuation-in-part (CIP)

### INVENTORSHIP IDENTIFICATION

WARNING: If the inventors are each not the inventors of all the claims, an explanation of the facts, including the ownership of all the claims at the time the last claimed invention was made, should be submitted.

My residence, post office address and citizenship are as stated below, next to my name. I believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter that is claimed, and for which a patent is sought on the invention entitled:

### TITLE OF INVENTION

Method of operation of a Printing Unit and Printing Unit for Offset-machine

### SPECIFICATION IDENTIFICATION

the specification of which: (complete (a), (b) or (c))

- ☐ (a) is attached hereto.
- ☐ (b) was filed on \_\_\_\_\_ as ☐ Serial No. \_\_\_\_\_ or ☐ Express Mail No. (as Serial No. not yet known) \_\_\_\_\_ and was amended on \_\_\_\_\_ (if applicable).

Note: Amendments filed after the original papers are deposited with the PTO that contain new matter are not accorded a filing date by being referred to in the Declaration. Accordingly, the amendments involved are those filed with the application papers or, in the case of a supplemental Declaration, are those amendments claiming matter not encompassed in the original statement of invention or claims. See 37 CFR 1.67.

☒ (c) was described and claimed in PCT International Application No. PCT/DK98/00303 filed on July 3, 1998 and as amended under PCT Article 19 on \_\_\_\_\_ (if any).

## ACKNOWLEDGEMENT OF REVIEW OF PAPERS AND DUTY OF CANDOR

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information, which is material to patentability as defined in 37, Code of Federal Regulations, § 1.56,

*(also check the following items, if desired)*

- ☐ and which is material to the examination of this application, namely, information where there is a substantial likelihood that a reasonable Examiner would consider it important in deciding whether to allow the application to issue as a patent, and
- ☐ in compliance with this duty, there is attached an information disclosure statement, in accordance with 37 CFR 1.98.

## PRIORITY CLAIM (35 U.S.C. § 119(a)-(d))

I hereby claim foreign priority benefits under Title 35, United States Code, § 119(a)-(d) of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed.

*(complete (d) or (e))*

- ☐ (d) no such applications have been filed.
- ☒ (e) such applications have been filed as follows.

*Note: Where item (c) is entered above and the international application which designated the U.S. itself claimed priority check item (e), enter the details below and make the priority claim.*

## PRIOR FOREIGN/PCT APPLICATION(S) FILED WITHIN 12 MONTHS (6 MONTHS FOR DESIGN) PRIOR TO THIS APPLICATION AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. § 119(a)-(d)

COUNTRY (OR INDICATE IF PCT)	APPLICATION NUMBER	DATE OF FILING (day/month/year)	PRIORITY CLAIMED UNDER 35 USC 119
Denmark	PA 1997 00800	3 July 1997	<input checked="" type="checkbox"/> YES      NO <input type="checkbox"/>
			<input type="checkbox"/> YES      NO <input type="checkbox"/>
			<input type="checkbox"/> YES      NO <input type="checkbox"/>
			<input type="checkbox"/> YES      NO <input type="checkbox"/>
			<input type="checkbox"/> YES      NO <input type="checkbox"/>

**CLAIM FOR BENEFIT OF PRIOR U.S. PROVISIONAL APPLICATION(S)**  
**(34 U.S.C. § 119(e))**

I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below:

PROVISIONAL APPLICATION NUMBER	FILING DATE

**ALL FOREIGN APPLICATION(S), IF ANY, FILED MORE THAN 12 MONTHS  
(6 MONTHS FOR DESIGN) PRIOR TO THIS U.S. APPLICATION**

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*Note: If the application filed more than 12 months from the filing date of this application is a PCT filing forming the basis for this application entering the United States as (1) the national stage or (2) a continuation, divisional, or continuation-in-part, then also complete ADDED PAGES TO COMBINED DECLARATION AND POWER OF ATTORNEY FOR DIVISIONAL, CONTINUATION OR CIP APPLICATION for benefit of the prior U.S. or PCT application(s) under 35 U.S.C. § 120.*

**POWER OF ATTORNEY**

I hereby appoint the following practitioner(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith *(list name and registration number)*.

12 Thomas F. Peterson, 24790; Richard J. Streit, 25765; Timothy J. Keefer, 35567; Dennis K. Scheer, 39356; Douglas S. Rupert, 44434; Steven L. Schmid, 39358; Paul B. West, 18947; Joseph H. Handelman, 26179; Peter D. Galloway 27885; John Richards, 31503; Iain C. Baillie, 24090; Richard P. Berg, 28145

- ☐ Attached, as part of this declaration and power of attorney, is the authorization of the above-named practitioner(s) to accept and follow instructions from my representative(s).

**SEND CORRESPONDENCE TO:**

Thomas F. Peterson  
c/o Ladas & Parry  
224 South Michigan Avenue  
Chicago, Illinois 60604

**DIRECT TELEPHONE CALLS TO:**

*(Name and telephone number)*

(312) 427-1300

**DECLARATION**

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

## SIGNATURE(S)

Note: Carefully indicate the family (or last) name, as it should appear on the filing receipt and all other documents.

### Full name of sole or first inventor

Henrik Leimand  
(Given Name) (Middle Initial or Name) (Family (or Last) Name)

Inventor's signature Henrik Leimand

Date 13/12 - 99. Country of Citizenship Denmark

Residence Bjert

Post Office Address Engdraget 18, DK-6091 Bjert, Denmark DKX

### Full name of second joint inventor, if any

\_\_\_\_\_  
(Given Name) (Middle Initial or Name) (Family (or Last) Name)

Inventor's signature \_\_\_\_\_

Date \_\_\_\_\_ Country of Citizenship \_\_\_\_\_

Residence \_\_\_\_\_

Post Office Address \_\_\_\_\_

### Full name of third joint inventor, if any

\_\_\_\_\_  
(Given Name) (Middle Initial or Name) (Family (or Last) Name)

Inventor's signature \_\_\_\_\_

Date \_\_\_\_\_ Country of Citizenship \_\_\_\_\_

Residence \_\_\_\_\_

Post Office Address \_\_\_\_\_